

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 2-6, 9-21 are presently active in this case. Claims 9 and 17 are amended by way of the present amendment.

In the outstanding Office Action, Claims 2-9 and 16-18 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,073,576 to Moslehi; Claims 10-13 and 19-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of U.S. Application No. 2002/0029745 A1 to Nagaiwa; and Claims 14 and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Moslehi and Nagaiwa, and further in view of U.S. 2002/0029745 to Sago.

Turning now to the merits, in order to expedite issuance of a patent in this case, Applicants have amended the pending independent claims to clarify the patentable features of the present invention over the cited references. Specifically, independent Claim 9, as amended, recites a temperature-controlled shield ring for shielding a substrate holder in a semiconductor processing system. The temperature-controlled shield ring includes a cap having a coolant passage therein, and a plenum adaptor coupled to the cap and configured to connect to a coolant system for circulating coolant to the coolant passage. The plenum adaptor has a plenum adapter ring configured to be supported by the substrate holder when the shield ring is shielding the substrate holder. Also recited is that the plenum adaptor does not include any fastening mechanism that mechanically fixes the shield ring to the substrate holder to maintain a position of the shield ring on the substrate holder. Claim 17 similarly recites that the temperature controlled shield ring rests on the second surface of the temperature controlled substrate holder without any fastening mechanism that mechanically

fixes the shield ring to the substrate holder to maintain a position of the shield ring on the temperature controlled substrate holder.

Thus, Applicants Claims 9 and 17 have been amended to clarify that the temperature controlled shield ring does not include any fastening mechanism that mechanically fixes the shield ring to the substrate holder to maintain a position of the shield ring on the substrate holder. This negative limitation is clearly supported by Applicants' specification at paragraphs 14 and 29.¹ This feature provides an advantage in that the temperature controlled shield ring can be provided on existing substrate holders without reworking the existing substrate holder to include mounting hardware.²

The cited reference to Moslehi et al. discloses a substrate clamping device for holding a substrate during processing. As seen in Fig. 10 of Moslehi et al., a peripheral edge of the substrate 352 is contacted by the clamp 386 to hold the substrate in place. A heating unit 378 is provided in a center region of the substrate holder, and support ring 398 is provided radially outward of the heating unit 378 such that the heating unit and support ring support the clamp 386 in position. A pair of O-rings 392 create a "second seal" between the support ring 398 and the clamp 386, and the support ring 398 includes a coolant passage (not numbered) therein, which cools the O-rings to prevent failure by overheating. Further, coolant conduits 372, 374, and 376 are provided at an interface of the clamp 386 with the heating unit 378, such that cooling gas can flow through the conduits to cool the substrate.

Moslehi et al. does not explicitly describe how the clamp 386 is fixed to the heating unit 378 and support ring 398. However, Figure 10 far left side shows a fastener receptacle (not numbered, hereafter "left side fastener") that appears to clamp an outer flange of the support ring 398 to a main body of the substrate holder. Further, inlet conduit 408 is

¹ US 2004/0244949 (Applicants' published application) at paragraphs 14 and 29.

² Applicants' published specification at paragraph 14.

provided through an inner flange of the support ring 398 and into a body of the substrate holder. Finally, Figure 10 appears to show a fastener (unnumbered) positioned radially outward of the substrate on a right side of the drawing (hereafter, “right side fastener”).

While not clearly depicted, this fastener appears to have a square head embedded within the clamp 386 and a threaded rod that extends through the heating unit 378 and insulating plate 368 into a body of the substrate holder.

The Office Action takes the position that the left side fastener in Figure 10 does not interface with the *plenum adapter* as required by the claims, and that the inlet conduit is not a fastener at all. As note above, however, Claims 9 and 17 now recites that the *shield ring* does not include any fastening mechanism that mechanically fixes the shield ring to the substrate holder. Applicants submit that even though the left side fastener may not directly “interface” with the support ring 398, the fastener fixes (directly or indirectly) the support ring to the substrate holder. Further, the fact that item 408 in Figure 10 is called an “inlet conduit” does not preclude this item from also being a fastener. Indeed, the dashed lines in Figure 10 may indicate that the inlet conduit 408 is a hollow threaded rod that couples the support ring 398 to the main body of the substrate holder. Still further, the right side fastener appears to fix the clamp 386 to the heating unit 378 and support ring. In this regard, Applicants submit that the clamp 386 must be fixed to the heating unit 378 and support ring 398 in order to seal the coolant conduits 372 and seals 392.

The fact that Moslehi does not explicitly describe how the various parts of the substrate holder are fixed together does not mean that no fasteners exist in Moslehi’s substrate holder. As noted above, Figure 10 of Moslehi provides evidence that the support ring 398 (cited as the shield ring) is fixed directly and/or indirectly to the substrate holder. therefore, Moslehi does not disclose that the temperature controlled shield ring does not

include any fastening mechanism that mechanically fixes the shield ring to the substrate holder to maintain a position of the shield ring on the substrate holder, as required by amended Claims 9 and 17. Further, as discussed in the September 26, 2007 amendment, Applicants maintain that the ring 398 is not a support ring at all, and is described in Moslehi et al. as an “extension of the chuck body.”³

The secondary references do not correct the above deficiencies. As seen in Fig. 8 of Nagaiwa et al. a focus ring 52 having backside cooling is positioned adjacent to the substrate W. Not only does the focus ring have different functionality than the claimed shield ring (i.e. it is not a shield ring at all), but the focus ring is clearly fastened to the substrate holder by fastener 56A. Further, Sago is cited for features of the dependent claims and does not disclose the absence of fasteners as required by Claims 9 and 17.

The Office Action takes the position that the lack of fasteners is an “intended use” of the shield ring. However, Applicants’ amended Claims 9 and 17 recite this negative limitation as a structural feature of the claimed temperature controlled shield ring. Further, as noted above, the absence of fasteners provides a substantial benefit in that the temperature controlled shield ring can be provided on existing substrate holders without expensive and complex retrofitting to include fastening devices for the substrate holder. The prior art devices cannot provide this advantage.

Therefore, Claims 9 and 17 patentably define over the cited references. As the remaining pending claims in this case depend from Claim 9 or 17, these remaining dependent claims also patentably define over the cited references.

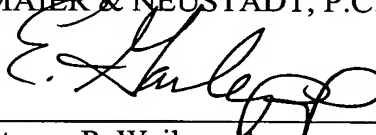
³ 6,073,576 (Moslehi et al.) at col. 14, lines 54-65.

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Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application. The present application is believed in condition for formal allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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